



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Carl Sandburg Learning Center
Date of Test Report	2/17/2023
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	36
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.3 pCi/L

Project Status:

1. Initial testing completed.



February 17, 2023

Mr. Brian Croyle
Environmental Specialist
Montgomery County Public Schools
Gaithersburg, MD 20879

Re: **Radon Testing Services**
KCI Job # 122210551

Location: Carl Sandburg Learning Center
451 Meadow Hill Dr.
Rockville, MD 20851

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Carl Sandburg Learning Center, located at 451 Meadow Hill Dr. Rockville, MD 20851 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or www.epa.gov/radon.

KCI visited the site on January 24, 2023 and deployed forty-two (42) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI also included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on January 27, 2023 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Accustar Labs - MA. for analysis by gamma-ray spectroscopy.

Accustar Labs - MA is a NRSB certified analytical laboratory for radon analysis (certification #ARL0017) located at 2 Saber Way, Ward Hill, MA 01835.

Evaluation of Testing Conditions:

These tests represent:

- Follow up to initial testing.

These tests were conducted to:

- Evaluate radon concentration levels at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility’s HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate temperatures ranged from the 31°F to 52°F. Maximum sustained winds ranged from 5-25 miles per hour. Average humidity was around 60% with .32 inches of precipitation (rain) was recorded during testing period.

Results:

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf
Radon Measurement Provider
#111004 RT
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-3, Radon Test Summary Spreadsheets
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Carl Sandburg Learning Center		
Test Period: 01/24/2023 - 01/27/2023		
Kit Number	Room / Area	Result
11131982	1	0.7
11131999	1	1.1
11288193	2	0.9
11131995	3	0.7
11132000	4	0.9
11132166	5	0.8
11131996	6	1.2
11633499	7	1.0
11131974	8	0.9
11288267	10	1.2
11288271	10	0.9
11288270	12	1.3
11288274	14	0.9
11288269	16	1.3
11288273	18	0.8
11288268	20	0.5
11633480	11A	1.1
11131971	11B	1.0
11131991	APR	0.5
11131992	APR	1.0
11131973	BEACH ROOM	0.8
11131998	BS OFFICE	0.7
11132133	CONFERENCE	< 0.3
11132152	HEALTH	< 0.3
11131972	IMC	0.8
11633500	IMC	0.6
11131981	IPAD REPAIR	< 0.3
11633479	IPAD REPAIR	0.8
11131989	KITCHEN	1.1
11132196	MAIN	< 0.3
11132149	PRINCIPAL	< 0.3
11288262	PRINCIPAL	0.8
11132151	R3	0.8
11288191	R4	0.9
11131997	R5	0.9
11132200	R6	0.8
11288220	R7	1.3
11132169	R8	0.7
11131990	STAFF / REPAIRS	1.1
11131994	STAFF / REPAIRS	1.2
11288192	STAGE	1.1
11131993	WORKROOM	< 0.3

Table 2- Radon Testing Results			
Carl Sandburg Learning Center			
Test Period: 01/24/23 - 01/27/23			
Kit Number	QC Type	Room / Area	Result
11131982	D	1	0.7
11288267	D	10	1.2
11131972	D	IMC	0.8
11131981	FB	iPad Repair	< 0.3
11132149	FB	Principal	< 0.3
11131990	D	Staff / repairs	1.1
11633975	OB	OFFICE BLANK	< 0.3
11633983	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Carl Sandburg Learning Center		
Test Period: 01/24/23 - 01/27/23		
Kit Number	Room/Area	Result
	N/A	

Summary of Missing, Compromised and >= 4 piC/L Tests		
Carl Sandburg Learning Center		
Test Period: 01/24/23 - 01/27/23		
Kit Number	Room/Area	Result
	N/A	

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131982	1	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.7 ± 0.4	2023-01-31
11131999	1	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.1 ± 0.4	2023-01-31
11131971	11B	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.0 ± 0.4	2023-01-31
11131995	3	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.7 ± 0.3	2023-01-31
11132000	4	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11132166	5	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11131996	6	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.2 ± 0.4	2023-01-31
11131974	8	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11131991	APR	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.5 ± 0.4	2023-01-31
11131992	APR	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.0 ± 0.4	2023-01-31
11131973	BEACH ROOM	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11131998	BS OFFICE	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.7 ± 0.4	2023-01-31
11132133	CONFERENCE	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31
11132152	HEALTH	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31
11131972	IMC	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11131981	IPAD REPAIR	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31
11131989	KITCHEN	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.1 ± 0.4	2023-01-31
11132196	MAIN	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31
11132149	PRINCIPAL	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31
11132151	R3	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11131997	R5	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11132200	R6	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11132169	R8	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.7 ± 0.4	2023-01-31
11131994	STAFF / REPAIRS	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.2 ± 0.4	2023-01-31
11131990	STAFF / REPAIRS	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.1 ± 0.4	2023-01-31
11131993	WORKROOM	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	< 0.3	2023-01-31

February 1, 2023

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11288267	10	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.2 ± 0.4	2023-01-31
11288271	10	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11633480	11A	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.1 ± 0.4	2023-01-31
11288270	12	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.3 ± 0.4	2023-01-31
11288274	14	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11288269	16	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.3 ± 0.4	2023-01-31
11288273	18	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11288193	2	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11288268	20	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.5 ± 0.4	2023-01-31
11633499	7	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.0 ± 0.4	2023-01-31
11633500	IMC	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.6 ± 0.3	2023-01-31
11633479	IPAD REPAIR	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.3	2023-01-31
11288262	PRINCIPAL	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.8 ± 0.4	2023-01-31
11288191	R4	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	0.9 ± 0.4	2023-01-31
11288220	R7	2023-01-24 @ 1:00 pm	2023-01-27 @ 10:00 am	1.3 ± 0.4	2023-01-31
11288192	STAGE	2023-01-24 @ 12:00 pm	2023-01-27 @ 10:00 am	1.1 ± 0.4	2023-01-31

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KC1 TECHNOLOGIES, INC Job Number 208343

NOMINAL Conditions: Radon Conc 34.7 pCi/L Rel. Hum 49.4 % Temp. 69.6 F

Date Start: 12/24/22 Date Stop: 12/27/22 Date Start: _____ Date Stop: _____

Time Start: 0810 Time Stop: 0810 Time Start: _____ Time Stop: _____

Device No.'s: (5) CHAR BAGS - Device No.'s: _____

11285109, 11285110, 11285101

THRU 11285103

BY LEFT

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

**Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 μ R/h Elevation = 820 ft**

December 29, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

OFFICE

MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11285110	SK1	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	31.7 ± 2.5	2022-12-29
11285101	SK2	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	30.1 ± 2.4	2022-12-29
11285103	SK3	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	34.0 ± 2.7	2022-12-29
11285102	SK4	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	30.9 ± 2.5	2022-12-29
11285109	SK5	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	32.0 ± 2.6	2022-12-29

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – Week 2 January Schools

Name of Schools:

1. Springbrook HS
2. White Oak MS
3. Cloverly ES
4. Georgian Forest ES
5. Harmony Hills ES
6. Poolesville ES
7. Montrose Center
8. Kingsley Wilderness
9. Poolesville HS
10. Carl Sandburg Learning Center

	Date	Initials
Radon Test Kits Deployed	01/24/2023	BMMY
Radon Test Kits Collected	01/27/2023	BMM
Radon Test Kits Shipped to Lab*	01/27/2023	BMM
Radon Test Kits Received by Lab*	01/31/2023	BMM

*All samples sent to Air Check, inc., 2 Saber Way, Ward Hill, MA 01835



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Carl Sandburg Learning Center
Date of Test Report	05/12/2022
Round of Testing	Initial <u>Follow-up</u> Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	5
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.7 pCi/L

Project Status

Current Project Status at this time: Testing Completed; no further action needed



May 12, 2022

Mr. Brian Croyle, PG, CHMM
Environmental Specialist
Montgomery County Public Schools
Gaithersburg, MD 20879

Re: **Radon Testing Services**
KCI Job # 122108316

Location: Carl Sandburg Learning Center
1002 First St.
Rockville, MD 20850

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Carl Sandburg Learning Center, located at 1002 First St. Rockville, MD 20850 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or www.epa.gov/radon.

KCI visited the site on March 21, 2022 and deployed seven (7) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

KCI sampled the following locations during this follow-up test:

1. Rooms with missing test kits from the Radon 2022 testing period (i.e. test kit was deployed but not recovered),
2. Rooms with invalidated test kits from the Radon 2022 testing period (e.g. an open window in the room or disturbed test kit),
3. Rooms which were locked/inaccessible during the Radon 2022 testing period,
4. Rooms with elevated radon results (i.e. ≥ 3.5 pCi/L),
5. Rooms previously tested for radon but not tested in Radon 2022, and
6. Additional rooms that require testing (if applicable.)

A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI also included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on March 24, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the low 40°Fs and high temperatures ranged from the low 50°Fs to the low 70°Fs. Maximum sustained winds ranged from 0 - 29 miles per hour. Average humidity was around 56% with 0.51 inches of precipitation (rain) was recorded during testing period.

Results:

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf
Radon Measurement Provider
#111004 RT
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-3, Radon Test Summary Spreadsheets
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Carl Sandburg Learning Center RT		
Test Period: 03/21/2022 - 03/24/2022		
Kit Number	Room / Area	Result
11139290	100A	< 0.3
11139283	100B	< 0.3
11139284	100B	< 0.3
11139289	100B	< 0.3
11139276	100C	< 0.3
11139269	100E	0.7
11139278	100G	< 0.3

Table 2- Radon Testing Results			
Carl Sandburg Learning Center RT			
Test Period: 03/21/2022 - 03/24/2022			
Kit Number	QC Type	Room / Area	Result
11139283	D	100B	< 0.3
11139284	FB	100B	< 0.3
11139902	OB	OFFICE BLANK	< 0.3
11139928	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Carl Sandburg Learning Center RT		
Test Period: 03/21/22 - 03/24/22		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and \geq 4 piC/L Tests		
Carl Sandburg Learning Center RT		
Test Period: 03/21/22 - 03/24/22		
Kit Number	Room/Area	Result
	NA	

Table Note:
 * Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

March 28, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139290	100A	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28
11139283	100B	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28
11139284	100B	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28
11139289	100B	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28
11139276	100C	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28
11139269	100E	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	0.7 ± 0.3	2022-03-28
11139278	100G	2022-03-21 @ 2:00 pm	2022-03-24 @ 1:00 pm	< 0.3	2022-03-28

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

NOMINAL Conditions: Radon Conc 27.0 pCi/L Rel. Hum 50.1 % Temp. 70.0 F

Date Start: 3/18/22 Date Stop: 3/21/22 Date Start: _____ Date Stop: _____

Time Start: 0705 Time Stop: 0705 Time Start: _____ Time Stop: _____

Device No.'s: (5) Char Bags - Device No.'s: _____

11139367, 11139368, 11139371, _____

11139710, 11139717 _____

E3 Right

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 μ R/h Elevation = 820 ft

March 30, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139367	SK1	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.9 \pm 2.1	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	23.9 \pm 2.0	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.7 \pm 2.1	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	26.4 \pm 2.1	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	24.6 \pm 2.0	2022-03-30

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools – Retesting

Name of Schools:

1. Rosa Parks MS
2. Poolesville ES
3. Wyngate ES
4. Seven Locks ES
5. Walt Whitman HS
6. Somerset ES
7. Rock Creek Forest ES
8. Walter Johnson HS
9. Westbrook ES
10. Westland MS
11. Farmland ES
12. College Gardens ES
13. Julius West MS
14. Robert Frost MS
15. Carl Sandburg Learning Center

	Date	Initials
Radon Test Kits Deployed	03/21/2022	BMM
Radon Test Kits Collected	03/24/2022	BMM
Radon Test Kits Shipped to Lab*	03/25/2022	BMM
Radon Test Kits Received by Lab*	03/28/2022	BMM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Rd, Mills River, NC 28759



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Carl Sandburg Learning Center
Date of Test Report	2/21/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	57
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	2.5 pCi/L

Project Status:

Initial testing completed; Missing or Compromised tests to be re-sampled



February 21, 2022

Brian T. Croyle, PG, CHMM
Environmental Specialist
Montgomery County Public Schools
Gaithersburg, MD 20879

Re: **Radon Testing Services**
KCI Job # 122108316

Location: Carl Sandburg Learning Center
1002 First St.
Rockville, MD 20850

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Carl Sandburg Learning Center, located at 1002 First St. Rockville, MD 20850 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or www.epa.gov/radon.

KCI visited the site on January 19, 2022 and deployed sixty six (66) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI also included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on January 22, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc.

is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

These tests represent:

- Initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 50s and high temperatures ranged from the mid 40s to the low 60s Fahrenheit. Maximum sustained winds ranged from 7-15 miles per hour. Average humidity was around 50% with .15 inches of precipitation (rain) was recorded during testing period.

Results:

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf
Radon Measurement Provider
#111004 RT
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-3, Radon Test Summary Spreadsheets
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Carl Sandburg Learning Center		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105775	100	0.6
11105776	100	0.6
11105783	100	< 0.3
11105738	101	1.2
11105786	102	< 0.3
11105729	103	0.9
11105787	104	0.6
11105737	105	0.7
11105724	106	< 0.3
11105731	107	< 0.3
11105726	108	< 0.3
11105725	109	< 0.3
11105736	109	< 0.3
11105746	110	< 0.3
11105743	111	< 0.3
11105745	112	< 0.3
11105744	113	< 0.3
11105740	114	< 0.3
11105741	115	< 0.3
11105761	116	< 0.3
11105733	117	1.1
11105734	117	0.7
11105763	118	< 0.3
11105756	119	0.9
11105758	120	< 0.3
11105701	121	0.6
11105772	122	0.5
11105760	123	< 0.3
11105778	124	< 0.3
11105759	125	< 0.3
11105769	125	< 0.3
11105770	125	< 0.3
11105766	126	< 0.3
11105777	126	0.5
11105767	127	1.0
11105765	129	< 0.3
11105780	131	< 0.3
11105779	132	< 0.3
11105788	133	< 0.3
11105774	136	2.5
11105739	145	< 0.3
11106130	145	< 0.3

Table 1- Radon Testing Results		
Carl Sandburg Learning Center		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11106131	145	< 0.3
11105753	146	< 0.3
11105742	147	< 0.3
11105718	153	< 0.3
11105762	154	< 0.3
11105749	156	< 0.3
11105764	163	0.8
11105768	165	< 0.3
11105781	100H	< 0.3
11105773	100M	< 0.3
11105782	100P	< 0.3
11105784	100Q	0.9
11105707	101C	0.7
11105785	104B	< 0.3
11105732	105C	0.6
11105723	106D	< 0.3
11105751	109B	< 0.3
11105752	110C	< 0.3
11105747	113B	< 0.3
11105748	116A	< 0.3
11106129	116A	< 0.3
11106101	116B	< 0.3
11105757	118C	< 0.3
11105771	122A	< 0.3

Table 2- Radon Testing Results			
Carl Sandburg Learning Center			
Test Period: 12/13/2021-12/16/2021			
Kit Number	QC Type	Room / Area	Result
11105725	D	109	< 0.3
11106130	D	145	< 0.3
11106131	FB	145	< 0.3
11105748	D	116A	< 0.3
11105770	D	125	< 0.3
11105759	FB	125	< 0.3
11105777	D	126	0.5
11105775	D	100	0.6
11105783	FB	100	< 0.3
11106126	OB	OFFICE BLANK	< 0.3
11105790	TB	TRAVEL Blank	< 0.3

Summary of Missed Locations		
Carl Sandburg Learning Center		
Test Period: 01/25/22 - 01/28/22		
Kit Number	Room/Area	Result
NA	100C	NA
NA	100B	NA
NA	100G	NA
NA	100E	NA
NA	100A	NA

Summary of Missing, Compromised and ≥ 4 piC/L Tests		
Carl Sandburg Learning Center		
Test Period: 01/25/22 - 01/28/22		
Kit Number	Room/Area	Result
	NA	

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:**CARL SANDBURG****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11105783	100	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105775	100	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	0.6 ± 0.3	2022-01-31
11105776	100	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	0.6 ± 0.3	2022-01-31
11105781	100H	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105773	100M	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105782	100P	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105784	100Q	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	0.9 ± 0.3	2022-01-31
11105738	101	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	1.2 ± 0.3	2022-01-31
11105707	101C	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11105786	102	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105729	103	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	0.9 ± 0.3	2022-01-31
11105787	104	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	0.6 ± 0.3	2022-01-31
11105785	104B	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105737	105	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11105732	105C	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	0.6 ± 0.3	2022-01-31
11105724	106	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105723	106D	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105731	107	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105726	108	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105725	109	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105736	109	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105751	109B	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105746	110	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105752	110C	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105743	111	2022-01-25 @ 10:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105745	112	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105744	113	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105747	113B	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105740	114	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105741	115	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105761	116	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105748	116A	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11106129	116A	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11106101	116B	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105734	117	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	0.7 ± 0.3	2022-01-31
11105733	117	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	1.1 ± 0.3	2022-01-31
11105763	118	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31

Radon test result report for:**CARL SANDBURG****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11105757	118C	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105756	119	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	0.9 ± 0.3	2022-01-31
11105758	120	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105701	121	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	0.6 ± 0.3	2022-01-31
11105772	122	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	0.5 ± 0.3	2022-01-31
11105771	122A	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105760	123	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105778	124	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105769	125	2022-01-25 @ 11:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105770	125	2022-01-25 @ 11:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105759	125	2022-01-25 @ 11:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105777	126	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	0.5 ± 0.3	2022-01-31
11105766	126	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105767	127	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	1.0 ± 0.3	2022-01-31
11105765	129	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105780	131	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105779	132	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105788	133	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105774	136	2022-01-25 @ 12:00 pm	2022-01-28 @ 8:00 am	2.5 ± 0.4	2022-01-31
11106131	145	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105739	145	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11106130	145	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105753	146	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105742	147	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105718	153	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105762	154	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105749	156	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105764	163	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	0.8 ± 0.3	2022-01-31
11105768	165	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 203404

NOMINAL Conditions: Radon Conc 16.2 pCi/L Rel. Hum 28.8 % Temp. 59.9 F

Date Start: 12/24/21 Date Stop: 12/27/21 Date Start: _____ Date Stop: _____

Time Start: 0809 Time Stop: 0809 Time Start: _____ Time Stop: _____

Device No.'s: (2) Char Bags- Device No.'s: _____

9341721, 9341722

64 left

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

**Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 µR/h Elevation = 820 ft**

December 31, 2021

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

SK
MA MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (16.2 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9341721	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	11.6 \pm 0.9	2021-12-31
9341722	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	15.4 \pm 1.2	2021-12-31

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – January 2022 Schools

Name of Schools:

1. Carver Educational Center
2. College Gardens ES
3. Farmland ES
4. Julius West MS
5. Maryvale ES
6. Robert Frost MS
7. Rock Creek Forest ES
8. Sandburg Learning Center
9. Westbrook ES

	Date	Initials
Radon Test Kits Deployed	01/19/2022	DM
Radon Test Kits Collected	01/22/2022	DM
Radon Test Kits Shipped to Lab*	01/22/2022	DM
Radon Test Kits Received by Lab*	01/24/2022	DM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Rd, Mills River, NC 28759